



Entergy  
Operations

Ref. 10CFR50.73(a)(2)(i)

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W3B5-92-0058  
A4.05  
QA

March 6, 1992

U.S. Nuclear Regulatory Commission  
ATTENTION: Document Control Desk  
Washington, D.C. 20555

Subject: Waterford 3 SES  
Docket No. 50-382  
License No. NPF-38  
Reporting of Licensee Event Report

Gentlemen:

Attached is Licensee Event Report Number LER-92-001-01 for Waterford Steam Electric Station Unit 3. This Licensee Event Report supplement is submitted to provide additional information and clarification acquired during the investigation of the events described. This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(i).

Very truly yours,

*D. F. Packer for OCP*

D.F. Packer  
General Manager - Plant Operations

DFP/WEF/rk  
Attachment

cc: Messrs. R.D. Martin  
G.L. Florreich  
J.T. Wheelock - INPO Records Center  
E.L. Blake  
N.S. Reynolds  
NRC Resident Inspectors Office

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LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

Waterford Steam  
Electric Station Unit 3YEAR SEQUENTIAL REVISION  
NUMBER NUMBER NUMBER

0 5 0 0 0 3 8 2 9 1 - 0 0 1 - 0 1 0 2 OF 0 8

TEXT (If more space is required, use additional NRC Form 305A's) (17)

Reportable Occurrence:

Technical Specification (TS) surveillance requirement 4.2.3.2(a) requires that the Azimuthal Power Tilt (Aztilt) be determined to be within the Azimuthal Tilt Allowance installed in the Core Protection Calculator (CPC)(EIIIS Identifier-JC-CPU) above 20% of Rated Thermal Power by continuously monitoring the Aztilt with the Core Operating Limit Supervisory System (COLSS)(EIIIS Identifier-ID), when the COLSS is operable. Since the improper value of the COLSS-CPC Azimuthal Tilt Limit was present, TS surveillance requirement 4.2.3.2(a) was not met during the time period from July 20, 1991 until January 21, 1992.

In addition, TS surveillance requirement 4.2.3.2(c) requires that at least every 31 days the COLSS Aztilt Alarm is actuated at an Aztilt value greater than the Aztilt Allowance used in CPCs. Nuclear Engineering surveillance procedure NE-005-103, COLSS Alarm Verification, and the associated COLSS surveillance test software, did not require that the COLSS Aztilt Alarm actuate at an Aztilt value greater than the CPC Aztilt Allowance while testing the COLSS Aztilt Alarm function; therefore, TS surveillance 4.2.3.2(c) was not met since the issuance of the operating license on December 18, 1984.

Upon further investigation of the COLSS Alarm Test Surveillance Software used in procedure NE-005-103, it was determined that the literal interpretation of the TS surveillance requirement in section 4.2.1.3 and 4.2.4.3 for Linear Heat Rate (LHR) and Departure from Nucleate Boiling Ratio (DNBR) respectively, were not met since the issuance of the Operating License on December 18, 1984. This event is reportable under 10 CFR 50.73(a)(2)(i).

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATIONESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS  
INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD  
COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS  
AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR  
REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO  
THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE  
OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

Waterford Steam  
Electric Station Unit 3

0 5 0 0 0 3 8 2 9 2 — 0 0 1 — 0 0 3 OF 0 8

TEXT (If more space is required, use additional NRC Form 305A (a) (17))

Initial Conditions:Plant Power: 100%Mode: 1Procedure Being Performed:

NONE

Technical Specification LCOs in Effect Specific to this Event:

NONE

Major Equipment Out of Service Specific to this Event:

NONE

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-320), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Waterford Steam  
Electric Station Unit 3

DOCKET NUMBER (2)

0 5 0 0 0 3 8 2

LER NUMBER (6)

YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
92	001	011

PAGE (3)

04 OF 08

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Event Sequence

The Waterford 3 Plant Monitoring Computer (PMC)(EIIS Identifier-ID) is a centralized, real-time computer system which integrates traditional computerized balance-of-plant monitoring with nuclear applications software for normal plant operation and emergency conditions. One program run by the PMC is the COLSS. One of the functions of COLSS is to calculate Aztilt. Limitations on Aztilt are provided to ensure that design safety margins are maintained. COLSS calculates Aztilt by utilizing inputs from the incore detector (EIIS Identifier-IG) system. However, the CPC utilizes a fixed value of Aztilt that can be changed by the operator, via an addressable constant. It is necessary to use an addressable constant because the radial peaking factors used in the CPCs to calculate power distribution are based on an untilted power distribution. In order to make the operator aware of situations when actual Aztilt is greater than the fixed CPC value (i.e. non-conservative), COLSS generates an alarm whenever this occurs. Since there is no direct connection between the COLSS and CPC systems, the operator uses a COLSS addressable constant (K24500) to enable COLSS to know the value of the CPC Aztilt Allowance.

While verifying point values for Aztilt on the PMC, Operations personnel noticed that the COLSS-CPC Aztilt Limit (PID K24500) was set higher than the CPC Aztilt Allowance (PID 063). On July 20, 1991, COLSS-CPC Aztilt Limit (PID K24500) was changed to 0.0178 and CPC Aztilt Allowance (PID 063) was changed to 1.0178, due to a reduction in reactor power for turbine (EIIS Identifier-TA) maintenance. (Because of the software differences in COLSS and CPCs, the values for COLSS of 0.0178 and CPCs of 1.0178, are actually equal). On July 21, 1991, CPC Aztilt Allowance (PID 063) was changed to 1.0125, as reactor power was returning to 100%, but COLSS-CPC Aztilt Limit (PID K24500) was left at 0.0178. The difference in the values remained until they were discovered on January 22, 1992.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Waterford Steam  
Electric Station Unit 3

DOCKET NUMBER (2)

05000382

LER NUMBER (5)

PAGE (3)

YEAR SEQUENTIAL REVISION  
NUMBER NUMBER NUMBER

92-001-d1 d5 OF 08

TEXT (If more space is required, use additional NRC Form 308A's) (17)

On January 22, 1992, when the discrepancy between the COLSS-CPC Aztilt Limit and CPC Aztilt Allowance was discovered, the COLSS-CPC Aztilt Limit was immediately changed to a value of the Core Azimuthal Tilt that corresponded to the CPC Aztilt Allowance. Because of the improper COLSS-CPC Aztilt limits, the TS Surveillance requirement was not met during the period from July 21, 1991 to January 22, 1992.

During investigation of the improper COLSS-CPC constants event, it was discovered that the plant procedure NE-005-103, COLSS Alarm Verification, and associated COLSS Surveillance test software, which were intended to implement TS Surveillance Requirements 4.2.1.3, 4.2.3.2(c), and 4.2.4.3, did not fully implement the TS requirements. Procedure NE-005-103, COLSS Alarm Verification, implemented the COLSS surveillance software, which in turn generated the alarm conditions for DNBR, LHR, and Aztilt regardless of the results produced by the COLSS alarm logic, thereby testing only the hardware alarm circuitry. The methodology used in the COLSS Surveillance Test Software to meet the surveillance requirements of TS 4.2.1.3, 4.2.3.2(c), and 4.2.4.3 was implemented at the suggestion of Combustion Engineering. (reference letter C-CE-8075 dated October 29, 1982)

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

Waterford Steam  
Electric Station Unit 3

0 5 0 0 0 3 8 2 9 2 - 0 0 1 - 0 1 0 6 OF 0 8

TEXT (If more space is required, use additional NRC Form 386A's) (17)

Sequence of Events:

7-20-91 COLSS-CPC Aztilt Limit (PID K24500) was changed to 0.0178, and CPC Aztilt Allowance (PID 063) was changed to 1.0178, due to a reduction in reactor power for turbine maintenance

7-21-91 CPC Aztilt Allowance (PID 063) value was changed to 1.0125, due to an increase in reactor power, but COLSS-CPC Aztilt Limit (PID K24500) value was left at 0.0178. Operations personnel used procedure OP-004-006, Core Protection Calculator System, section 6.2, Changing Addressable Constants, instead of section 8.2, CPC Tilt Allowance Adjustment.

1-22-92 Operations personnel were performing a review of the PMC data, which involved verifying point values for Aztilt. Operations personnel noticed that the COLSS-CPC Aztilt Limit (PID K24500) was set higher than the CPC Aztilt Allowance (PID 063)

1-22-92 When the discrepancy between the COLSS-CPC Aztilt Limit and CPC Aztilt Allowance was discovered, the COLSS-CPC Aztilt Limit was immediately changed to a value that corresponded with the CPC Aztilt Allowance

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (2-500104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Waterford Steam Electric Station Unit 3	DOCKET NUMBER (2)  0 5 0 0 0 3 8 2	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 2	— 0 0 1	— 0 1	0 7	OF	0 8

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Causal Factors

The cause of the incorrect COLSS constant is a combination of inadequate administrative controls in ensuring that changes in CPC Aztilt Allowance initiated a corresponding change in the COLSS-CPC Aztilt Limit and operator inadequate attention to detail. Waterford 3 is revising procedures to ensure that CPC Aztilt Allowance values are greater than or equal to the COLSS Aztilt Limit and that CPC Aztilt Allowances are greater than or equal to core aztilt. Operations personnel involved in this event were counseled.

The cause of the failure to meet TS surveillance requirements of 4.2.1.3, 4.2.3.2(c), and 4.2.4.3, was a misinterpretation of the TS Surveillance requirements during procedure development. Guidance was utilized from Combustion Engineering (reference letter C-CE-8075 dated October 29, 1982) to develop the procedure to ensure that the intent of the TS was being met. However, this interpretation of the TS does not agree with the letter of the TS Surveillance requirements.

Corrective Measures

1. Immediate corrective actions were to correct the discrepancy between the COLSS-CPC Aztilt Limit and CPC Aztilt Allowance.
2. Waterford 3 is revising OP-004-006, Section 6.2, Core Protection Calculator System, to ensure that when a change is made to the CPC Aztilt Allowance addressable constant (PID 063), a corresponding change will be made to the COLSS Aztilt Limit (PID K24500). The estimated completion date for changes to OP-004-006 is April 4, 1992.
3. Operations personnel involved in this event were counseled.
4. NE-005-103, and associated test software was revised to fully comply with TS 4.2.1.3, 4.2.3.2(c), and 4.2.4.3 alarm testing requirements.

No other COLSS-CPC related procedures exist which could have a similar error.



LICENSEE EVENT REPORT (LER)  
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FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (5)

PAGE (3)

Waterford Steam  
Electric Station Unit 3YEAR SEQUENTIAL  
NUMBER REVISION  
NUMBER

0 5 0 0 0 3 8 2 9 2 — 0 0 1 — 0 1 0 8 OF 0 8

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Safety Significance

Between July 20, 1991 and January 22, 1992, COLSS-CPC Aztilt Limit (PID K24500) had a higher value than the CPC Aztilt Allowance (PID 063). During this time period, the Limiting Condition for Operation (LCO) for Azimuthal Power Tilt in excess of Azimuthal Power Tilt Allowance never exceeded the time limit for the LCO action requirement; therefore, the health and safety of the public and plant personnel were not jeopardized during this event.

Previous Events

NONE